

~~Claim 1. A method for controlling the operating condition of a~~

computer processor comprising the steps of:

determining a maximum allowable power consumption level from the operating condition of the processor,

determining a maximum frequency which provides power not greater than the allowable power consumption level,

determining a minimum voltage which allows operation at the maximum frequency determined, and

dynamically changing the operating condition of the processor by changing the frequency and voltage to the maximum frequency and

~~minimum voltage determined.~~

Claim 2. A computing device comprising:

a power supply furnishing selectable output voltages,

a clock frequency source,

a central processor including:

a processing unit for providing values indicative of operating conditions of the central processor, and

a clock frequency generator receiving a clock frequency from the clock frequency source and providing a selectable output clock frequency to the processing unit; and

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means for detecting the values indicative of operating conditions of the central processor and causing the power supply and clock frequency generator to furnish an output clock frequency and voltage level for the central processor.

Claim 3. A computing device as claimed in Claim 2 in which the means for detecting the values indicative of operating conditions of the central processor comprises control software for determining an output clock frequency and voltage level for the central processor adapted to conserve power while maintaining an effective execution rate.

Claim 4. A computing device as claimed in Claim 2 in which the clock frequency generator provides a plurality of selectable output clock frequencies, and

the means for detecting the values indicative of operating conditions of the central processor causes the clock frequency generator to generate frequencies which are selected for optimum operation of a plurality of functional units of the computing device.

Claim 5. A method for controlling the power used by a computer comprising the steps of:

utilizing control software to measure the operating characteristics of a central processor of the computer,

determining when the operating characteristics of the central processor are significantly different than required by the operations being conducted, and

8 changing the operating characteristics of the central processor to a level
9 commensurate with the operations being conducted.

10 Claim 6. ~~A method as claimed in Claim 5 in which:~~

11 the step of determining when the operating characteristics of the central
12 processor are significantly different than required by the operations being
13 conducted comprising utilizing the control software to determine
14 desirable voltages and frequencies for the operation of the central
15 processor based on the measured operating characteristics, and
16 the step of changing the operating characteristics of the central
17 processor to a level commensurate with the operations being conducted
18 comprises providing signals:

19 for controlling voltages furnished by a programmable power supply
20 to the central processor, and

21 for controlling frequencies furnished by the central processor to
22 the central processor.

23 Claim 7. A method as claimed in Claim 6 in which the step of
24 changing the operating characteristics of the central processor to a level
25 commensurate with the operations being conducted comprises also
26 providing signals for controlling frequencies furnished by the central
27 processor to other functional units of the computer.

28 Claim 8. A computer comprising:

29 a power supply furnishing selectable output voltages,

3 a clock frequency source,
 4 a bus,
 5 system memory,
 6 a central processor including:

7 a processing unit for providing values indicative of operating
 8 conditions of the central processor, and

9 a clock frequency generator receiving a clock frequency from the
 10 clock frequency source and providing a selectable output clock
 11 frequency to the processing unit; and

12 means for detecting the values indicative of operating conditions of the
 13 central processor and causing the power supply and clock frequency
 14 generator to furnish an output clock frequency and voltage level for the
 15 central processor.

1 Claim 9. A computer as claimed in Claim 8 in which the means for
 2 detecting the values indicative of operating conditions of the central
 3 processor comprises control software for determining an output clock
 4 frequency and voltage level for the central processor adapted to conserve
 5 power while maintaining an effective execution rate.

1 Claim 10. A computing device as claimed in Claim 8 in which the clock
 2 frequency generator provides a plurality of selectable output clock
 3 frequencies, and

4 the means for detecting the values indicative of operating conditions of
 5 the central processor causes the clock frequency generator to generate
 6 frequencies which are selected for optimum operation of a plurality of
 7 functional units of the computing device including system memory.

1 Claim 11. A computing device as claimed in Claim 8 in which the clock
 2 frequency generator provides a plurality of selectable output clock
 3 frequencies, and

4 the means for detecting the values indicative of operating conditions of
 5 the central processor causes the clock frequency generator to generate
 6 frequencies which are selected for optimum operation of a plurality of
 7 functional units of the computing device including the bus.

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